CLAIMS

1. Reactor device (R) for carrying out chemical reactions requiring heat exchange, said reactor, which is elongate along an axis (XX'), having, at a first end, at least one means (16) for supplying at least one reactant and, at an opposite end, at least one means (18) for evacuating the effluents formed, and having a plurality of heat exchange means (12) separated by at least one internal partition (14) participating in controlling the residence time of the reactant or reactants and increasing the heat exchange surface inside the reactor, and passages for circulating the reactant or reactants and/or effluents, provided between said heat exchange means and said internal partitions, characterized in that the reactor (R) has at least one enclosure (10) made of a refractory material ensuring heat insulation and containing the heat exchange means (12) and internal partitions (14), and in that said enclosure is contained in an envelope (20) containing the reactant or reactants and/or effluents circulating inside said reactor.

2. Device according to Claim 1 in which internal partitions (14) are made of modular elements.

3. Device according to Claim 1 or 2, characterized in that the internal partitions (14) have recesses for receiving the heat exchange means (12).

4. Device according to Claim 2 or 3 in which the internal partitions (14) are formed of abutting modular elements with a shape designed to obtain the desired residence time inside the reactor for the reactant or reactants and the effluents.

5. Device according to Claim 2 or 3 in which the internal partitions (14) are made of non-abutting modular elements with a shape designed to obtain the desired residence time inside the reactor for the reactant or reactants and the effluents.

6. Device according to one of Claims 1 to 5 in which the cross section of the containment envelope 20 is substantially quadrilateral in shape.

7. Device according to one of Claims 1 to 6, characterized by having an outer shell (22) whose cross section is substantially circular and whose inside diameter is substantially equal to the largest dimension of the outside diagonal of containment envelope (20).

8. Device according to one of Claims 1 to 7 in which enclosure (10) is made of an inorganic refractory material and containment envelope (20) is made of a metal.

9. Device according to one of Claims 1 to 8 in which enclosure (10) has linking and/or anchoring means to the containment envelope (20).

10. Device according to one of Claims 1 to 9 in which enclosure (10) is made of a refractory material chosen from porous ceramics, nonporous ceramics, refractory concretes, and aluminous concretes.

11. Device according to one of Claims 1 to 10 in which enclosure (10) is fitted to containment envelope (20) in such a way as to prevent gas bypasses between the outside of said enclosure and the inside of said envelope.

12. Device according to one of Claims 1 to 11, characterized by having means for assembling and disassembling the heat exchange means (12) and well as

internal partitions (14) and at least one means for accessing the inside of reactor (R).

13. Use of the device according to one of Claims 1 to 12 to bring about thermal pyrolysis of a hydrocarbon feedstock included in the group of hydrocarbon feedstocks principally containing ethane and hydrocarbon feedstocks principally formed by naphtha.

14. Use of the device according to one of Claims 1 to 12 for bringing about a dehydrogenation reaction of a hydrocarbon feedstock principally containing saturated hydrocarbons.

15. Use of the device according to one of Claims 1 to 12 to bring about a dehydrogenation reaction of a hydrocarbon feedstock chosen from the group formed by hydrocarbon feedstocks principally containing propane and by hydrocarbon feedstocks principally containing ethylbenzene.

16. Use of the device according to one of Claims 1 to 12 to bring about a thermal cracking reaction of a feedstock principally containing hydrogen sulfide.